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SCIENCE

NEW YORK, AUGUST 11, 1893.

BOTANY AT THE FAIR.

BY H. L. BOLLEY, FARGO, NORTH DAKOTA.

Aside from the extensive opportunities for notes and observations upon miscellaneous herbaria and growing plants, collected from all parts of the earth, which are open to visitors of the Fair, it may not be inappropriate to note some of the special attractions for such persons as are botanically inclined.

While the name *Horticulture* has the place of honor upon the great plant house in the west portion of the Park, the place is none the less of botanical interest. Indeed, if adverse criticism is at all deserved in this department, it would be along the line that it is more a huge botanic garden than a horticultural show.

The amateur botanist, who, at his place of training, has complained that he has not been afforded sufficient opportunity for observation upon varied plant life, may in this building introduce himself to almost all known varieties of cultivated flowering and ornamental plants, which are representative of all lands. It is useless to attempt citations. None shown, however, are of more interest than the specimens representative of dwarfing methods, as conducted by the Japanese gardeners.

Grasses: Each exhibitor, fully understanding the importance of grasses and forage plants in an agricultural exhibit, has made careful effort to have his State or region fully represented as to its capabilities of producing these lines of plants. The great agricultural hall and the different State and national buildings thus present, in the aggregate, a list of native and cultivated grasses, more extensive as to numbers and more properly prepared for educational effect as to their qualities, form, growth, characteristics, etc., than it has ever previously been possible for any one to examine. Many of the States have full displays in bunch form, showing all characters, roots, leaves and seeds; while, again, ordinary herbarium specimens are to be noted almost anywhere one may go in the agricultural exhibits.

College and Experiment Station Exhibit: Located in the southeast corner of the agricultural building is the collective exhibit of agricultural colleges and experiment stations. Here again in the botanical alcove the varied nature of the exhibits makes it probable that few may pass through without noticing something individually interesting. Necessarily, the above is arranged more for show purposes than as a working laboratory, yet very much of the best work that has been done at the different stations is here represented, either by work in actual operation, apparatus, or by results graphically displayed. There are numerous photographs and drawings representing results gained in accurate experimental tests, as, for example, graphic results in crossing, by L. H. Bailey; results obtained in spraying for potato rot, by L. R.

Jones, and many others. Photographs are shown of European and other foreign botanists, together with nearly a full list of our experimental botanists.

All the more common plant diseases are represented by pathological specimens, drawings, microphotographs and maps of distribution. This exhibit is a most varied and interesting one, containing, aside from the numerous specimens representing rusts, smuts, mildews, bacterial diseases, etc., many illustrations of results gained in prevention of plant diseases, such, for example, as grape rot, apple scab, potato rot and potato scab.

Different methods of seed-testing are in operation, displaying, among others, the following pieces: Nobbe's apparatus, Kiel-Zurich-Geneva germinator, the North Carolina seedpan, and E. S. Goff's various improved appliances. There are also illustrations of water and sand cultures, and various appliances and specimens too numerous to be listed at this time, among which may be noted B. D. Halsted's weeds and weed seeds, an exhibit of root tubercles upon native legumes, good microscopic exhibits, and T. L. Scribner's complete micro-photographic outfit.

Plant Physiology: A case full of apparatus for the study of special questions in plant physiology, prepared by Prof. J. C. Arthur, is worthy of special notice by any one who may pass through the laboratory. With the exception of a few standard pieces, all the different appliances had their origin and construction in the Purdue laboratories, and in finish are elegant examples of student work. Only mention may be made of a few of the more interesting pieces. Suffice it to say that probably no laboratory in the country has at this time an equally interesting collection of original or modified pieces for this sort of work. Noticeable among these are the following: Respiration appliances, a modification of Sach's method for determination of amount of carbon dioxide exhaled by plants; an apparatus for the comparison of normal and intramolecular breathing of seedlings, and one to illustrate intramolecular breathing of yeast in an atmosphere of carbon dioxide gas; auxanometers of three types of construction; chuo-stats of common type and one of intermittent action. This last piece is new and original, of elegant construction, and is especially applicable to the study of the force of habit as evidenced in plant life. There are dynamometers of various types for measuring various plant forces; transpiration pieces, including a potometer for the quantitative determination of the amount of water given off by a given leaf surface in a given length of time; a poroscope; root-pressure appliances, and many smaller pieces, which are quantitative in their results. With all these contents, this case is worthy of the close consideration of any person interested in plant physiology. If all the pieces are not as suited to their work as might be wished, they are at least much to be preferred to those with which most of us have worked, and indicate future possibilities of more accurate results in this field of botany. Finally, there is a chance for most interesting study in two bacteriological laboratories, each fitted with all the latest and more essential appliances.